

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellants: D. Foote et al. Attorney Docket No. THAS122071
Application No: 10/723,846 Group Art Unit: 3673 / Confirmation No.: 9688
Filed: November 26, 2003 Examiner: V.A. Patel
Title: SEAL CONFIGURATION TO REDUCE SEAL EXTRUSION

APPELLANTS' APPEAL BRIEF

Seattle, Washington
June 25, 2007

TO THE COMMISSIONER FOR PATENTS:

This Appeal Brief is filed in support of the Notice of Appeal filed March 24, 2007, appealing the Examiner's final rejection dated January 24, 2007, of pending Claim 1. Claim 1 was rejected under 35 U.S.C. § 102(b) as being anticipated by Walker (U.S. Patent No. 4,150,836) and as being anticipated by Williamson (U.S. Patent No. 5,115,550).

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I. REAL PARTY IN INTEREST

The subject application is owned by the inventors Dean Foote, Scott Delbridge, and the estate of Clayton Delbridge, who are the real parties in interest.

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II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

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III. STATUS OF CLAIMS

Claim 1 has been finally rejected, and it is this rejection that is being appealed.

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IV. STATUS OF AMENDMENTS

No amendments to the application have been filed subsequent to the final rejection of January 24, 2007.

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V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 is directed to a seal configuration. An embodiment of the seal configuration is described in the specification at page 3, line 29 to page 5, line 6, and is depicted in FIGS. 1 through 7. Referring to FIGS. 1 and 2, the seal configuration 10 includes a body 12 that contains internal pressure. (Page 4, lines 11-12). The body has an opening 14 with inwardly tapered peripheral sidewalls 26. (Page 4, lines 12-13).

The seal configuration 10 further includes a closure 16 that closes the opening 14. (Page 3, lines 33-34). The closure 16 serves as a door that is adapted to be opened and closed at will. The closure has an attachment portion 28 larger than the opening with a planar surface 29 from which projects an axially projecting stopper portion 30 that fits closely within the opening 14. (Page 4, lines 14-16, and amended FIG. 2 with amended specification in applicants' Amendment dated November 17, 2006). The stopper portion 30 has an endless peripheral seal groove 32 extending in spaced relation around the axis in which is positioned a peripheral seal 34 that sealingly engages the tapered peripheral sidewalls 26 of the body 12 in interference fit relation, thereby conforming to the tapered peripheral sidewalls 26. (FIG. 4, and page 4, lines 16-24).

Additionally, the seal configuration includes a backing ring 36 of pliable memory retaining material sheltered from internal pressure within the body 12 by the peripheral seal 34. (FIG. 2, and page 4, lines 24-28). The backing ring 36 is positioned in close fitting relation around the projecting stopper portion 30 between the peripheral seal groove 32 and the planar surface 29 of the attachment portion 28 of the closure 16. (Page 4, lines 24-28). The backing ring 36 engages the tapered peripheral sidewall 26 of the body in interference fit relation and conforms to the tapered peripheral sidewall 26 while being sufficiently stiff as to resist extrusion flow under pressure. (FIGS. 4-7, and page 4, lines 28-32).

The seal configuration 10 is structurally configured such that when the peripheral seal 34 deforms in response to an increase in internal pressure 38 within the body and extrusion gaps 40 begin to form between the attachment portion 28 of the closure 16 and the body 12, the peripheral seal 34 is extruded in an axial direction 42 against the backing ring 36. (FIGS. 5-7, and page 4, line 32-page 5, line 3). The portion of the backing ring 36 engaging the tapered peripheral sidewall 26 of the body 12 plastically deforms by changing shape and applies sealing pressure at the extrusion gaps 40 to prevent the peripheral seal 34 from entering the extrusion gaps. (Page 5, lines 4-6).

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VI. GROUNDΣ OF REJECTION TO BE REVIEWED ON APPEAL

Claim 1 was rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,150,836 (Walker) and as being anticipated by U.S. Patent No. 5,115,550 (Williamson). In view of these rejections, the issues presented for review on appeal are as follows:

Issue 1: Whether Walker teaches the seal configuration claimed in Claim 1.

Issue 2: Whether Williamson teaches the seal configuration claimed in Claim 1.

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VII. ARGUMENT

In order to be anticipated, "every element of the claim must be shown in the reference, including all limitations." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920-21 (Fed. Cir. 1989). "[T]he reference must describe the claimed invention sufficiently to place it in the possession of a person of ordinary skill in the field." See *In re Paulsen*, 30 F.3d 1475 (Fed. Cir. 1997). It is appellants' position that neither Walker nor Williamson, as cited by the Examiner, anticipates Claim 1 of the present application.

Walker Does Not Teach the Seal Configuration in Claim 1

As shown in FIG. 2, Walker discloses a surface 20 that has a concentric cutout 28 formed therein. Walker explains: "The cutout 28 extends from the thread relief 30 of the fitting 10 by means of a smooth curve 32 to a frustro-conical portion 34... The cutout 28 provides a pocket to retain a backup ring 42" and includes "an inwardly facing cylindrically surfaced ring portion 40" that overhangs the backup ring 42. See Col. 3, lines 1-11 of Walker (emphasis added). "The backup ring 42... [has] a cylindrical outer surface 44 which is sized to mate with the ring surface 40 which prevents radial outward expansion thereof. Adjacent both sides of the cylindrical surface 44, the ring 42 has chamfered surfaces 46 and 48 of an angle which generally mates with the conventional chamfered portion 50 of the boss 16." See Col. 3, lines 15-24 of Walker. One chamfered surface extends outwardly from the pocket 28 and beyond surface 20. As further explained by Walker, "the fitting 10 is installed in the boss 16...as shown in FIG. 3A, with the backup ring 42 blocking the O-ring's 24 access to any gap 26..." (Col. 3, lines 46-49), by bridging the gap 26 with either chamfered surface 46 or 48 meeting the chamfered portion 50 of the boss 16 in a generally radial direction. As shown in FIG. 4 of Walker, as pressure is applied to the O-ring 24, the O-ring is forced into the cutout 28, underneath the backup ring 42.

Radial expansion of the backup ring 42 is a result of the pressure applied by the O-ring 24 in a generally radial direction. Extrusion of the O-ring 24 is prevented by the cylindrical surface 40 overhanging the backup ring 42 at ring surface 44 and the chamfered portion 50 of the boss 16 meeting chamfered surface 46 or 48 of the backup ring 42. The pressure from the female-male connection that is being sealed by the configuration in Walker is counteracted by the backup ring 42 in combination with the cylindrical surface 40 which act against expansion of the O-ring 24 in the radial direction to prevent it from extruding through the gap 26.

The seal configuration recited in appellants' Claim 1 does not read on the structure disclosed in Walker. Claim 1 clearly recites "*a planar surface from which projects an axially projecting stopper portion [30] that fits closely within the opening [14 of the body 12 that contains internal pressure], the stopper portion [30] having an endless peripheral seal groove [32]... in which is positioned a peripheral seal [34].*" Walker does not teach this structure. In the Office Action, the Examiner identified the radial side surface 20 of Walker as the claimed "planar surface" and suggested that the portion "that is contacted by ring surface 40" acts as the claimed "stopper portion." However, when the male and female portions of Walker are engaged, it is quite apparent that this portion is adjacent to the female portion that is being sealed, and does not project axially such that it "fits closely within the opening" as claimed. Furthermore, Claim 1 clearly recites a backing ring 36 that is "*positioned in close fitting relation around the stopper portion [30] between the peripheral seal groove [32] and the planar surface [29] of the attachment portion [28] of the closure [16].*" Since Walker does not teach a stopper portion as defined in Claim 1, Walker's backup ring 42 is not "positioned in close fitting relation around the projecting stopper portion," as claimed in Claim 1.

In addition, where the claimed backing ring 36 is positioned in close fitting relation with the stopper portion 30 and the planar surface 29, it is understood from Claim 1 that pressure from

the closure 16 forces the peripheral seal 34 axially against, and not under, the backing ring 36. The backing ring 36 is structurally defined in Claim 1 to resist expansion of the peripheral seal 34 in an axial direction (*"the peripheral seal is extruded in an axial direction against the backup ring... [which] prevent[s] the peripheral seal from entering the extrusion gaps"*). To the contrary, the backup ring 42 in Walker is retained within a cutout 28 and resists an expansion of the O-ring 24 in a radial direction.

Moreover, to the extent the Patent Office considers the portion formed by thread relief 30 as the "axially projecting stopper portion" that is claimed in the present application, the backup ring 42 in Walker is spaced outward from the surface of the stopper portion to allow the O-ring 24 to fit underneath it when deformed. On the other hand, the backing ring 36 of Claim 1 is *"positioned in close fitting relation around the projecting stopper portion 30."* See FIGS. 2-7 in the present application. By rejecting Claim 1 as being anticipated by Walker, the Examiner is apparently equating a surface that applies a force in the radial direction (i.e., the ring surface 40 of cutout 28 in Walker) with a surface that applies a force in the axial direction (i.e., the planar surface of the attachment portion 28 in the present application), even though this distinction is clearly defined in Claim 1.

In essence, Walker is directed to an apparatus that redirects axial pressure, applied through an O-ring 24, to a generally radial direction, through the use of a specific cutout 28. The radial pressure is applied against a backup ring 42 that bridges an extrusion gap 26 between two mating surfaces 20 and 22. In contrast, the present application teaches a backup ring 36 that axially resists axial pressure acting against it (see arrows 38 and 42 in FIGS. 7 and 8 representing the axial pressure) precisely because the backup ring 36 is constrained in close fitting relation to a projecting stopper portion 30 on the inward side, the planar surface of the attachment portion 28 of closure 16, and the tapered peripheral sidewall 26 of the body 12. As defined in

Claim 1, the stopper portion 30 and backing ring 36 project inward of the female portion of the body 12. Walker simply does not describe a stopper portion 30 and a backing ring 36 that project inward to the body 12.

Appellants therefore submit that Walker does not teach all of the elements recited in Claim 1, inherently or explicitly, and thus Claim 1 is not anticipated by Walker.

Williamson Does Not Teach the Seal Configuration in Claim 1

Williamson teaches a lock nut 18 with a deformable skirt portion 22 and an O-ring 28 positioned on a base portion 38. The lock nut 18 is threaded onto the base portion 38, and is moved independently along the threads 40 once the O-ring 28 positioned on a bearing surface 24 engages the tapered O-ring pocket in female port 36. See also lock nut 44 and O-ring 72 in FIGS. 3 and 5.

In the Office Action, the Examiner equated the lock nut 44 with the "*backing ring of pliable memory retaining material*" claimed in Claim 1. Appellants submit that such a comparison is erroneous. Unlike the lock nut 44 of Williamson, the backing ring 36 in the present application is a passive element and is not independently acted upon. FIGS. 2-7 of the present application depict, and Claim 1 claims, the backing ring 36 "*positioned in close fitting relation around the projecting stopper portion [30]*" between the peripheral seal groove and the planar surface of the attachment portion [28] of the closure. Claim 1 further states that "*the peripheral seal is extruded against the backing ring, that portion of the backing ring engaging the tapered peripheral sidewall of the body plastically deforming by changing shape and applying sealing pressure at the extrusion gaps.*" The lock nut 44 according to Williamson is rotated and therefore moved forward on the threads 40, while in contrast the backing ring 36 of the present application remains in its "*close fitting*" position. None of the drawings in

Williamson show the lock nut 44 positioned in close fitting relation with the adapter 46, which the Examiner equates to the planar surface defined in Claim 1. This feature of Claim 1 cannot be presumed or inferred from Williamson, as the ability of the lock nut 44 to move away from adapter 46 is essential to its use. Indeed, the stated purpose of Williamson is to provide "an adjustable O-ring port fitting which allows for greater adjustment during the assembly of a hydraulic coupling" (Col. 2, lines 33–35). Williamson therefore does not teach "*a backing ring... positioned in close fitting relation around the projecting stopper portion between the peripheral seal groove and the planar surface of the attachment portion of the closure,*" as claimed in Claim 1.

It is further instructive to compare FIG. 5 of Williamson with the prior art shown in FIG. 3B of Walker. Just as with the conventional fitting shown in FIG. 3B of Walker (where an O-ring 24 under high pressure is subject to extrusion through a gap 26 between surface 20 and face 22), the O-ring 72 shown in FIG. 5 of Williamson is also subject to extrusion through a gap between annular skirt portion 58 and the tapered interior edge of the female port 36 when under high pressure. The lock nut 44 cannot be equated with the backing ring 36 of Claim 1 in the present application because the backing ring 36, as claimed, is closely fitted "*around the projecting stopper portion [30] between the peripheral seal groove [32] and the planar surface of the attachment portion [28]... to prevent the peripheral seal [34] from entering the extrusion gaps [40].*" The lock nut 44 of Williamson provides no such structure and has no such configuration that prevents an extrusion of the O-ring 72 when under high pressure.

VIII. CONCLUSION

In light of the above arguments, appellants submit that both Walker and Williamson fail to teach or suggest each and every element of Claim 1. Accordingly, appellants submit that the Office Action has failed to present a *prima facie* case of anticipation that supports a rejection of Claim 1. The Board should direct that the 35 U.S.C. § 102(b) rejection of Claim 1 be withdrawn and the claim allowed.

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IX. CLAIM APPENDIX

1. A seal configuration, comprising:

a body that contains internal pressure, the body having an opening with inwardly tapered peripheral sidewalls;

a closure that closes the opening, the closure serving as a door adapted to be opened and closed at will, the closure having an attachment portion larger than the opening with a planar surface from which projects an axially projecting stopper portion that fits closely within the opening, the stopper portion having an endless peripheral seal groove extending in spaced relation around the axis in which is positioned a peripheral seal that sealingly engages the tapered peripheral sidewalls of the body in interference fit relation, thereby conforming to the tapered peripheral sidewalls; and

a backing ring of pliable memory retaining material sheltered from internal pressure within the body by the peripheral seal and positioned in close fitting relation around the projecting stopper portion between the peripheral seal groove and the planar surface of the attachment portion of the closure, the backing ring engaging the tapered peripheral sidewall of the body in interference fit relation and conforming to the tapered peripheral sidewall while being sufficiently stiff as to resist extrusion flow under pressure, such that when the peripheral seal deforms in response to an increase in internal pressure within the body and extrusion gaps begin to form between the attachment portion of the closure and the body, the peripheral seal is extruded in an axial direction against

the backing ring, that portion of the backing ring engaging the tapered peripheral sidewall of the body plastically deforming by changing shape and applying sealing pressure at the extrusion gaps to prevent the peripheral seal from entering the extrusion gaps.

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X. EVIDENCE APPENDIX

None.

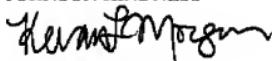
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XI. RELATED PROCEEDINGS APPENDIX

None.

Respectfully submitted,

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